

SmartSwitch 9000  
9C214-3 AC Power Supply  
Installation Guide

**CABLETRON**  
\_\_\_\_\_  
**SYSTEMS**

9032529-01



## Notice

Cabletron Systems reserves the right to make changes in specifications and other information contained in this document without prior notice. The reader should in all cases consult Cabletron Systems to determine whether any such changes have been made.

The hardware, firmware, or software described in this manual is subject to change without notice.

IN NO EVENT SHALL CABLETRON SYSTEMS BE LIABLE FOR ANY INCIDENTAL, INDIRECT, SPECIAL, OR CONSEQUENTIAL DAMAGES WHATSOEVER (INCLUDING BUT NOT LIMITED TO LOST PROFITS) ARISING OUT OF OR RELATED TO THIS MANUAL OR THE INFORMATION CONTAINED IN IT, EVEN IF CABLETRON SYSTEMS HAS BEEN ADVISED OF, KNOWN, OR SHOULD HAVE KNOWN, THE POSSIBILITY OF SUCH DAMAGES.

© Copyright November 1998 by:

Cabletron Systems, Inc.  
35 Industrial Way  
Rochester, NH 03867-5005

All Rights Reserved  
Printed in the United States of America

Order Number: 9032529-01

**Cabletron Systems** and **LANVIEW** are registered trademarks, and **SmartSwitch** is a trademark of Cabletron Systems, Inc.

**CompuServe** is a registered trademark of CompuServe, Inc.

**i960 microprocessor** is a registered trademark of Intel Corp.

**Ethernet** is a trademark of Xerox Corporation.

## FCC Notice

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**NOTE:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment uses, generates, and can radiate radio frequency energy and if not installed in accordance with the operator's manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference in which case the user will be required to correct the interference at his own expense.

**WARNING:** Changes or modifications made to this device which are not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

## VCCI Notice

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

## DOC Notice

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la class A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

## DECLARATION OF CONFORMITY ADDENDUM

Application of Council Directive(s): **89/336/EEC**  
**73/23/EEC**

Manufacturer's Name: **Cabletron Systems, Inc.**

Manufacturer's Address: **35 Industrial Way**  
**PO Box 5005**  
**Rochester, NH 03867**

European Representative Name: **Mr. J. Solari**

European Representative Address: **Cabletron Systems Limited**  
**Nexus House, Newbury Business Park**  
**London Road, Newbury**  
**Berkshire RG13 2PZ, England**

Conformance to Directive(s)/Product Standards: **EC Directive 89/336/EEC**  
**EC Directive 73/23/EEC**  
**EN 55022**  
**EN 50082-1**  
**EN 60950**

Equipment Type/Environment: **Networking Equipment, for use in a**  
**Commercial or Light**  
**Industrial Environment.**

We the undersigned, hereby declare, under our sole responsibility, that the equipment packaged with this notice conforms to the above directives.

Manufacturer

Mr. Ronald Fotino

Full Name

Principal Compliance Engineer

Title

Rochester, NH, USA

Location

Legal Representative in Europe

Mr. J. Solari

Full Name

Managing Director - E.M.E.A.

Title

Newbury, Berkshire, England

Location



## Contents

### Chapter 1 Introduction

Using This Manual.....	1-1
The 9C214-3 Power Supply.....	1-1
Features .....	1-3
Power Distribution System.....	1-4
Related Manuals.....	1-4
Getting Help .....	1-5

### Chapter 2 Installing the 9C214-3 Power Supply

Unpacking the 9C214-3 Power Supply .....	2-1
Installing to the SmartSwitch 9000 Chassis.....	2-1
Powering Up the 9C214-3 Power Supply .....	2-3

### Chapter 3 9C214-3 Power Supply Operation

Operating Functions .....	3-1
System Diagnostic Controller .....	3-2
Internal Temperature Sensor .....	3-2
Power Supply Cooling .....	3-2
LANVIEW LEDs .....	3-2
PWR Status LED .....	3-3
SMB Status LED .....	3-3
Power Supply Level Indicator LED .....	3-4

### Chapter 4 Specifications

Safety.....	4-1
Service.....	4-1
Physical.....	4-2
Environmental.....	4-2
Universal AC Input.....	4-2
Input Voltage .....	4-2
Fusing .....	4-2
AC Input Connection .....	4-2
Output Voltage .....	4-3



# Introduction

## Using This Manual

Read through this manual to become familiar with its contents and to gain an understanding of the features and capabilities of the 9C214-3 power supply prior to installing and operating it.

Chapter 1, **Introduction**, provides a brief description of the 9C214-3 power supply and its features. This chapter also includes a list of related manuals and information on getting help.

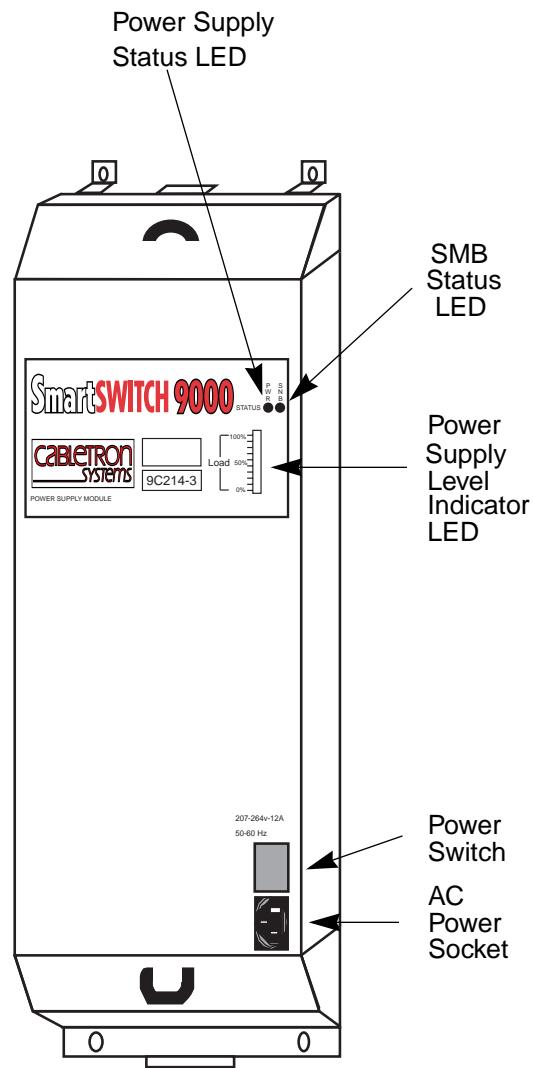
Chapter 2, **Installing the 9C214-3 Power Supply**, contains detailed steps for unpacking, installing, and powering up the 9C214-3 power supply.

Chapter 3, **9C214-3 Power Supply Operation**, contains detailed information regarding the power supply operation.

Chapter 4, **Specifications**, provides detailed specifications of the 9C214-3 power supply.

## The 9C214-3 Power Supply

The 9C214-3 power supply, shown in Figure 1-1, is a 2000 watt, triple output supply that provides power to the SmartSwitch 9000 chassis. At least one power supply must be installed; however, additional power supplies can be installed to achieve redundancy. When two or more power supplies are installed, the system uses a current sharing scheme where, under all load conditions, each supply provides power equally.



**Figure 1-1. The 9C214-3 Power Supply**

## Features

### **Diagnostic Controller for Management**

Each 9C214-3 power supply has a diagnostic controller which includes a microprocessor that monitors the numerous power supply functions available to the Network Manager via LCD, as well as local and remote management.

### **Internal Temperature Sensor**

Each 9C214-3 power supply has its own built-in temperature sensor for monitoring and reporting its own internal temperature to the Network Manager via LCD, as well as local and remote management.

### **Cooling Fan**

The diagnostic controller increases or decreases the fan speed based on the temperature of the power supply. In the event of microprocessor failure, fan speed defaults to 100% to ensure protection of the power supply.

### **Thermal Overload Protection**

A thermal shutdown circuit is included within each 9C214-3 power supply. This circuit protects the power supply from overheating if a thermal overload occurs. Automatic recovery takes place after the thermal overload condition is corrected.

### **Load Sharing**

Each 9C214-3 power supply uses a current sharing scheme whereby if two power supplies are used, under all load conditions, each supply provides 50% ( $\pm$  5%) of the required load on each output. This feature increases the life of a power supply.

### **Universal AC Input**

The 9C214-3 power supply accepts AC input voltage ranging from 207–264 volts at 50/60Hz.

### **Hot Swapping**

9C214-3 power supplies can be installed or removed from the back of the chassis while another power supply is operating without affecting network operation.

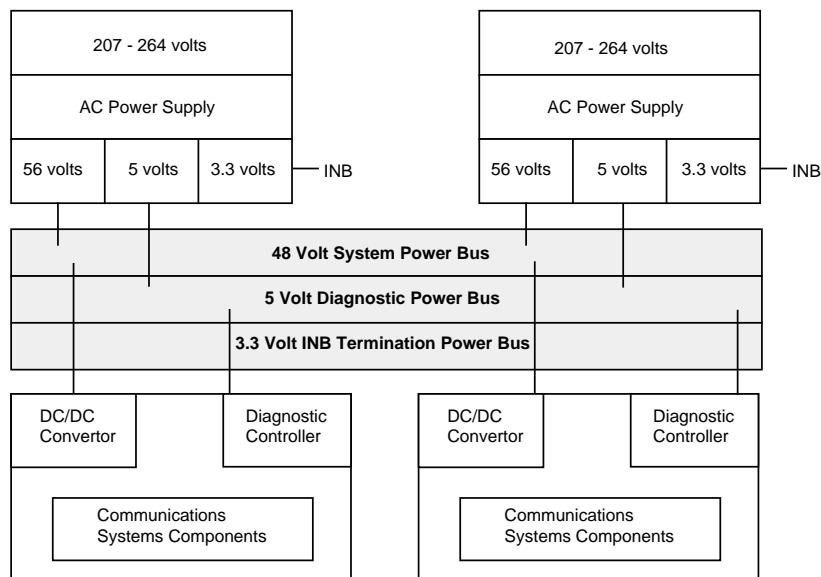
### **LANVIEW® LEDs**

Each 9C214-3 power supply has three LANVIEW LEDS: the PWR Status LED indicates the status of the 9C214-3 power output, the SMB Status LED indicates the status of the diagnostic controller, and the Power Supply Level Indicator LED indicates the percentage of the power supply load being used.

## Power Distribution System

The SmartSwitch 9000 uses a distributed DC power distribution system (Figure 1-2) similar to those used in super computers. Three separate power buses are used to distribute DC power. The 48-volt DC System Power Bus, located on the backplane, powers all modules and the system cooling fans. The Diagnostic Power Bus provides 5 volts DC to all of the system's diagnostic controllers and the Environmental Module. The INB Termination Power Bus provides 3.3 volts DC to the SmartSwitch 9000 INB termination modules (ITM).

To offer the greatest variety of power options, the 48-volt DC System Power Bus and all components that use this bus are capable of operating using voltage ranging from 40–60 volts DC. This capability allows the SmartSwitch 9000 to operate from typical AC power and to charge batteries in a battery backup unit or operate on DC power, such as found in a central office or a battery backup system.



**Figure 1-2. Distributed DC Power Distribution System**

## Related Manuals

The manuals listed below should be used to supplement the procedures and technical data contained in this manual.

**SmartSwitch 9000 Installation Guide**

**SmartSwitch 9000 9C300-1 Environmental Module User's Guide**

In addition, each Interface Module has a user's guide.

## Getting Help

For additional support related to this device or document, contact Cabletron Systems using one of the following methods:

World Wide Web	<a href="http://www.cabletron.com/">http://www.cabletron.com/</a>
Phone	(603) 332-9400
Internet mail	<a href="mailto:support@cabletron.com">support@cabletron.com</a>
FTP Login Password	<a href="ftp://ftp.cabletron.com/">ftp://ftp.cabletron.com/</a> <i>anonymous</i> <i>your email address</i>
To send comments or suggestions concerning this document, contact the Cabletron Systems Technical Writing Department via the following email address: <b>TechWriting@cabletron.com</b> <i>Make sure to include the document Part Number in the email message.</i>	

**Before calling Cabletron Systems, have the following information ready:**

- Your Cabletron Systems service contract number
- A description of the failure
- A description of any action(s) already taken to resolve the problem (e.g., changing mode switches, rebooting the unit, etc.)
- The serial and revision numbers of all involved Cabletron Systems products in the network
- A description of your network environment (layout, cable type, etc.)
- Network load and frame size at the time of trouble (if known)
- The device history (i.e., have you returned the device before, is this a recurring problem, etc.)



# Installing the 9C214-3 Power Supply

At least one power supply must be installed on the rear of the SmartSwitch 9000 chassis. Additional power supplies can be added to achieve redundancy.

A power supply is installed by plugging it into either the left or right power supply connector on the SmartSwitch 9000 chassis, as shown in Figure 2-1.

## Unpacking the 9C214-3 Power Supply

1. Unpack the power supply by removing it from the shipping box and sliding the two foam end caps off the unit. (Save the shipping box and packing materials in the event the power supply must be reshipped.)
2. Remove the power supply from the protective plastic bag. (Save the bag in the event the power supply must be reshipped.)
3. Examine the power supply carefully, checking for damage. If any damage exists, DO NOT install the power supply. Immediately contact the Cabletron Systems Global Technical Assistance Center.

## Installing to the SmartSwitch 9000 Chassis

1. Loosen and remove the two screws from one of the power supply connector covers on the rear of the SmartSwitch 9000 chassis.
2. Remove the cover. (Keep the cover in the event you need to remove the power supply. The cover must be replaced to protect the connector.)

3. Hold the power supply by the handles on the top and bottom of the unit and do the following:
  - a. Align the power supply so that the lip on the bottom and the hook on the top are slightly above the corresponding slots on the chassis.
  - b. Ease the power supply down until the hook catches the slot on the top and the tab is inserted in the slot on the bottom.
  - c. Plug the power supply in the connector on the back of the chassis by pushing the power supply in until its frame touches the surface of the SmartSwitch 9000 chassis. Do not force the power supply in place. If significant resistance is encountered before the frame is flush with the chassis, remove the power supply, realign it, and push it in again.
  - d. Secure the power supply to the chassis by tightening the two screws on the top and two screws on the bottom of the power supply. For proper chassis grounding, the four screws must be properly tightened.

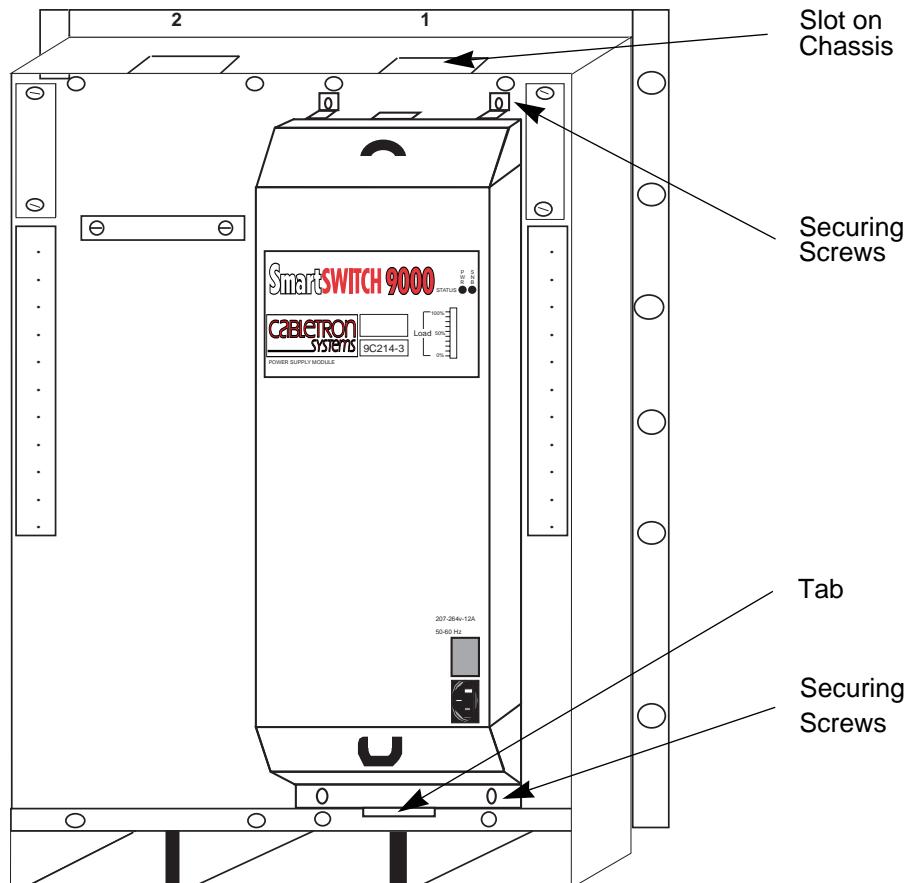
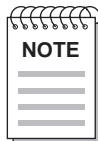


Figure 2-1. Installing the 9C214-3 Power Supply

## Powering Up the 9C214-3 Power Supply



*Before you turn the power switch on, make sure that the Environmental Module and all Interface Modules have been properly installed.*

The 9C214-3 Power Supply is powered up by following the steps below:

1. Plug one end of the power cord (supplied with the power supply) into the AC power socket on the lower right front corner of the power supply.
2. Plug the other end of the power cord into an AC receptacle. Turn on the power supply using the switch located near the power socket.
3. The power supply uses a soft start feature and does a pre-power diagnostic check. Outputs become enabled within 5 seconds of turning the power on.
4. Check to make sure that
  - a. The PWR Status LED is green.
  - b. The SMB Status LED is green.

If the LEDs are any color other than green, refer to **LANVIEW LEDs** in Chapter 3.



# 9C214-3 Power Supply Operation

The 9C214-3 power supply can operate with input voltages ranging from 207–264 VAC at 50/60 Hz. Each 9C214-3 provides a maximum of 2000 watts of power to the SmartSwitch 9000.

When two power supplies are installed, the system uses a current sharing scheme where, under all load conditions, each supply provides 50% ( $\pm$  5%) of the required load.

Each 9C214-3 power supply converts the 207–264 VAC to three different DC outputs for internal use by the system. Each of these outputs is described below.

- 56 volts supplied to the 48-volt DC System Power Bus for use throughout the chassis for each installed module and the Environmental Module system fans.
- 5 volts supplied to the Diagnostic Power Bus used by the diagnostic controllers and the Environmental Module.
- 3.3 volts supplied to the INB Termination Power Bus.

## Operating Functions

The 9C214-3 power supply includes the following functions:

- System Diagnostic Controller
- Internal Temperature Sensor
- Power Supply Cooling

## System Diagnostic Controller

The System Diagnostic Controller is composed of a Z-80 microprocessor and its supporting logic. The System Diagnostic Controller monitors the power supply's input and output power parameters as well as the temperature and fan status. In addition, the System Diagnostic Controller adjusts fan speed and controls the LANVIEW diagnostic LEDs. The information gathered by the System Diagnostic Controller is available to the network manager via the LCD, as well as via local and remote management. If the System Diagnostic Controller fails, the 9C214-3 power supply has been designed to continue to function and supply power to the system.

## Internal Temperature Sensor

Each 9C214-3 power supply has a built-in temperature sensor for monitoring its own internal temperature. The results of the monitoring are available to the network manager via LCD, as well as local and remote management.

## Power Supply Cooling

Each 9C214-3 power supply includes an internal cooling fan. The System Diagnostic Controller monitors the internal temperature of the power supply and increases or decreases the fan speed based on that temperature. If the System Diagnostic Controller fails, fan speed defaults to 100% to ensure protection of the power supply.

## LANVIEW LEDs

The LANVIEW LEDs on the back of the 9C214-3 power supply may be used as an aid for troubleshooting.

There are three LANVIEW LEDs visible to the user (Figure 3-1): the PWR Status LED, the SMB Status LED, and the Power Supply Level Indicator LED.

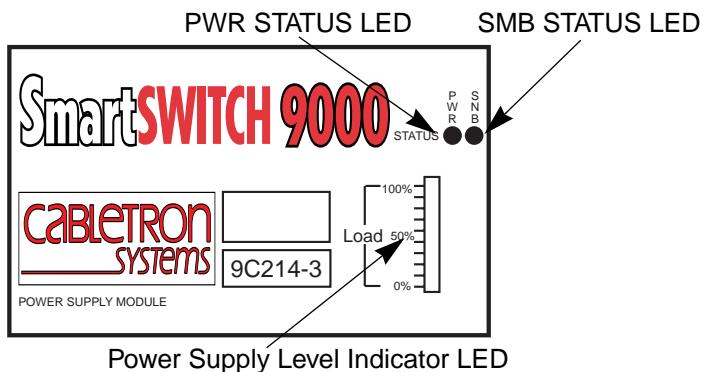


Figure 3-1. 9C214-3 Power Supply LANVIEW LEDs

### PWR Status LED

The PWR Status LED indicates the status of a power supply's input and output. The possible states and descriptions of the PWR Status LED are listed in Table 3-1.

Table 3-1. PWR Status LED

LED Color	State	Description
Green	Functional	The 56-volt, 5-volt, and 3.3-volt outputs are within established tolerances.
Yellow	Crippled	Not fully operational (56-volt output is not within established tolerances due to lack of AC input).
Red	Fault	One of the system power supply outputs is out of regulation.
Off	Power off	Module powered off.

### SMB Status LED

The SMB Status LED indicates the status of the diagnostic controller. The possible states and descriptions of the SMB Status LED are listed in Table 3-2.

Table 3-2. SMB Status LED

LED Color	State	Description
Green	Functional	Fully operational.
Yellow/Green	Booting	Flashes yellow and green while booting.
Yellow	Testing	Power up testing being performed.
Yellow (Flashing)	Crippled	Limited functionality of the diagnostic controller or fan failure.
Red	Reset	Normal power-up reset.
Red (Flashing)	Failed	Fatal error has occurred.
Off	Power off	Module powered off.

**Power Supply Level Indicator LED**

The Power Supply Level Indicator LED indicates the percentage of the power supply load. The possible states and descriptions of the Power Supply Level Indicator LED are listed in Table 3-3.

Table 3-3. Power Supply Level Indicator LED

Segment Number(s)	LED Color	State	Description
1–5	Green	10–50% of power load being used.	No action necessary.
6–9	Green	60–90% of power load being used. No parallel power supply operational.	No action necessary.
6–9	Yellow	60–90% of power load being used. Parallel supply(ies) installed; however, redundancy not available.	Add an additional power supply if redundancy is desired.
10	Yellow	Greater than 90% of power supply being used.	Add an additional power supply for redundancy.
11	Red	Overload condition exists.	Add an additional power supply or reduce number of modules in the chassis.

# Specifications

## Safety



*It is the responsibility of the person who sells the system to which the modules will be a part to ensure that the total system meets allowed limits of conducted and radiated emissions.*

The 9C214-3 power supply, when properly installed on the SmartSwitch 9000 chassis, complies with the following safety specifications and standards:

- UL 1950
- CSA C22.2 No. 950
- EN 60950
- IEC 950
- EMI Requirements of FCC Part 15 Class A
- EN 55022 Class A
- VCCI Class I
- EMC requirements of

EN 50082-1  
IEC 801-2 ESD  
IEC 801-3 Radiated susceptibility  
IEC 801-4 EFT

## Service

The 9C214-3 power supply is designed with the following service capability:

MTBF (MIL-STD-217): >200,000 hours projected

MTTR: <.50 hour

## Physical

### Dimensions

60.96 H x 19.05 W x 13.97 D centimeters  
(24 H x 7.5 W x 5.5 D inches)

### Weight

Unit: 8.6 kilograms (19 lbs.)  
Shipping: 9.9 kilograms (22 lbs.)

## Environmental

Operating Temperature: 5–40° C, 51–104° F

Operating Humidity: 5% to 95%

Cooling: 2.15 cubic meters (76 cubic feet) of air per minute drawn through the chassis

## Universal AC Input

Each 9C214-3 power supply accepts input voltage ranging from 207–264 volts at 50–60 Hz.

## Input Voltage

Each 9C214-3 power supply will draw the following current at maximum load:

11.2A @207 volts  
8.7A @264 volts

## Fusing

The AC input to the 9C214-3 power supply has a non-user serviceable 250 volt 15-amp fuse.

## AC Input Connection

The AC input connector is an IEC type entry requiring the use of the Cabletron-approved power cord provided with the 9C214-3 power supply.

## **Output Voltage**

Each 9C214-3 power supply is capable of generating the following output voltages:

56.0 volts @35A  
3.3 volts @17A  
5.1 volts @18A

*Specifications*

---